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ABSTRACT

Education policies can discriminate against different income groups through the supply of educational opportunities. Expansion of primary school facilities in neglected areas, in this case rural Colombia, may have a high rate of return as well as raise relative incomes of poor people. A simple theoretical model deals with linkages between efficiency in distribution of education and distribution of income. Despite increased percentages of enrollments at every educational level in Colombia, access to education in rural areas remains severely limited. Recent studies discuss private and social rates of return to primary schooling for males and females along with some reference to vocational schooling, which overall yielded the highest returns. Increasing rural primary school opportunities has far-reaching implications; for example, on effects of rural education on migration to urban areas, increased productivity, and rural economic development. Returns to primary education may be lower in rural than urban areas although the most advanced rural regions may receive highest returns to education. Even where private rate of return is low, benefits in crime prevention, health care, improved literacy, and lower birth rates justify the investment. Dropout prevention policies should be tied to expansion. (RS)

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Paper No. 54

Income Distribution and Colombian Rural Education

by

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Income Distribution and
Colombian Rural Education

In labor abundant economies one approach to raising the incomes of poor workers is to provide them with opportunities to become capitalists. Since it is difficult to save from low labor incomes and own physical capital, governments may instead offer access to human capital through their educational policies. Whether or not this is a sensible policy depends on the rate of return to education at different levels. That human capital is not a perfect substitute for physical capital is evident from the specter of unemployed university graduates in countries such as India. However, it is possible that an expansion of primary school facilities in neglected areas will have a high rate of return as well as raise the relative incomes of poor people. This paper examines such a possibility in the rural sector of Colombia.

This examination relies wholly on a synthesis of earlier research probing the behavior and effectiveness of Colombian education institutions in creating human capital for different groups and sectors of the economy. In the first part some of the available data on the characteristics of Colombia's education system are presented. A subsequent section develops a simple theoretical model dealing with the linkages between efficiency in the distribution of education and the distribution of income. Empirical evidence relating to these matters in Colombia is

introduced in the third section which is followed by a brief conclusion on the desirability of expanding rural primary education.

1. A Profile of the Colombian Educational System

Two major features of Colombian education are, first, its secular extension to greater numbers of people in the eligible age groups and, secondly, a marked disparity in educational opportunity between the rural and urban sectors of the economy in favor of the latter. Since the end of World War II enrollments at every educational level have been increasing at a faster rate than the growth of population. Using data from the population censuses it appears that the proportion of primary aged school children (7-14) attending private and public Colombian schools grew from 35 percent in 1951 to 52 percent in 1964. For children in the secondary school age bracket (15-19) the share attending schools rose from 12 to 23 percent. At the university level (ages 20-24) the number in attendance at universities more than doubled, from less than 2 to more than 4 percent, as a fraction of the population belonging to that age category. In 1968 according to a different source there were 2.7 million enrolled in primary school, 600,000 in secondary school and about 64,000 registered students in higher education.[1] As a percentage of the appropriate school age population these enrollments constituted 69 percent for primary schools (excluding over-age students at this level), 17 percent for secondary schools and 3 percent for institutions of higher learning. Over the

[1] Economic Growth of Colombia: Problems and Prospects, Vol. 1, the World Bank (Baltimore, Md.: The Johns Hopkins Press, 1972).

period 1960-68 growth rates in enrollment were 6.2, 11 and 14.2 percent respectively for primary, secondary and university education.

Concealed in the aggregate figures is a significant difference in the educational distributions for the rural and urban sectors of the economy. Access to education is severely limited in rural areas compared to urban centers. For children under 15 years of age the proportion who are of school age attending rural schools is about one-half as high as in the cities. In 1964 more than two-thirds of rural schools offered instruction only through the second grade while almost all the others went up to only the third grade. On the other hand, 62 percent of urban schools provide the full five years of primary school. In addition, less than ten percent of secondary schools are located in rural areas. The upshot of these disparate educational opportunities is an average length of schooling in rural areas of 1.7 years compared to an average duration of 5.1 years in urban localities. Some portion of this geographic difference in average educational exposure is due to the exceptionally high drop-out rates of rural students who fail to advance to the next grade even where this opportunity is available to them. In rural areas primary school graduates comprise only 3 percent of initial enrollments compared to 44 percent in urban areas.

Problems on the side of the demand for primary education have to be considered along with those which emanate from the supply side. The relatively low retention rates in rural schools could reflect the demand by parents for their children's time in productive activities on the farm, although this explanation is not too plausible in areas

of surplus labor, or it could be a rational response to a curriculum which is classical in nature, rather than applied, and of recognized low quality. Vis-a-vis urban sectors rural schools have fewer books and materials and are operated by less qualified, more poorly paid, teachers. Moreover, in some areas boys and girls attend at different times of day in order to maintain a sexual segregation considered to be desirable at that age. Although illiteracy has become steadi less prevalent in Colombia it remains substantially higher in rural than urban areas. As is shown in Table 1, illiteracy among men is about three times as frequent in rural than in urban areas and a similar relationship holds for women. Not all of this variation is attributable to a deficiency of rural educational opportunity, however, since many recipients of rural education undoubtedly migrated to urban centers during the intercensal period. These facts are well known and require no further amplification here. What is needed is to relate them to the broader picture of income distribution.

TABLE 1: Illiteracy Rates in Colombia

	Urban		Rural	
Year	Men	Women	Men	Women
1951	16.6	24.5	46.1	53.6
1964	11.9	17.4	38.4	44.4

Source: Population Censuses for 1951 and 1964

2. Education and Income Distribution

A less widely dispersed distribution of human capital would be expected under most conditions to generate a reduction in the dispersion of labor incomes.[1] Since the poor tend to participate in the Colombian educational system only at the primary level an expansion of primary enrollments, especially in rural areas, would likely lead to greater equality in incomes. However, if university and secondary education were expanded instead, middle and upper income groups would benefit disproportionately and the distribution of labor income would become more unequal. In Colombia where all of the educational tiers have experienced significant growth it is not obvious how aggregate expansion of the educational system has affected income distribution. Berry has noted that for men in the age bracket 15-59 years the Gini coefficient of the number of years of education attained has increased from .59 in 1951 to .84 in 1964.[2] Coupled with the other observation by Berry, that a year of primary education is worth less than a year of secondary or university education, it is likely that the recent growth of educational capacity has done little to improve income income distribution and, in fact, may have made it worse.

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[1] For an exposition of the theory and a survey of some of the evidence see J. Mincer, "The Distribution of Labor Incomes: A Survey with Special Reference to the Human Capital Approach," Journal of Economic Literature, VIII,1 (March, 1970).

[2] R. Albert Berry, "Some Determinants of Changing Income Distribution in Colombia: 1930-1970," Yale University Economic Growth Center Discussion Paper no. 137, March 22, 1972.

The confidence with which this last conclusion can be held is dependent on there not being a wide variance in rates of return to different educational levels. If, for example, the rates of return to primary education were significantly greater than those for higher levels, increasing of concentration in the distribution of school years completed could still be consistent with substantially less concentration in the distribution of labor incomes. A peculiar feature of human capital is that across the individuals in a society greater dispersion in rates of return will probably exist for human capital than for other types of capital. The characteristic of human capital responsible for this result is the nontransferability, the fact that the human agent receiving the investment cannot in a nonslave society use his asset as collateral for a loan. With no market in existence for human capital the rich always have the option of self-financing their educational investments while the poor may be unable to borrow to finance theirs.

Where public policies determine the supply of educational opportunities to different income groups it is possible for governments to discriminate in the returns to education to a degree that is not feasible in markets for physical capital where active trading reduces the scope for discrimination in rates of return. In less developed countries it is possible for governments dominated by elites to exclude generations of low income, politically impotent, groups from access to educational opportunity. In richer, developed countries where concern over matters of equity is important politically it is possible for governments to apply reverse discrimination and pursue educational policies which help the poor at the expense of those better off even though the return on the investment is relatively low.

These contrasting positions are depicted in Diagram 1.

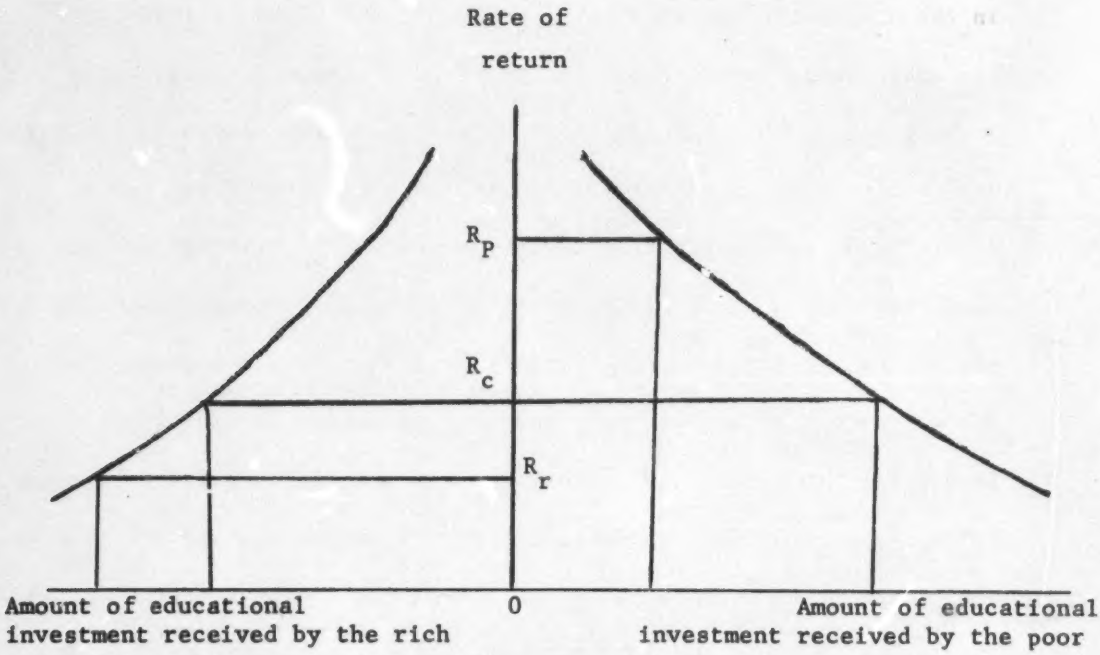

Diagram 1

Assuming rich and poor income groups have a similar distribution of abilities educational policies in countries like the United States may be interpreted as supplying, or trying to supply, educational opportunities to different income groups so that at the margin the rate of return on educational investment by a person in any income group is the same. In diagram 1 this goal of educational policy is achieved by the common rate of return R_c. An important issue in the United States is whether, having achieved the rate of return R_c, educational policy

should countenance even larger investments in the education of poor people.[1] At issue is whether the economic goal of static efficiency in the allocation of educational resources should be sacrificed to the ambition of reducing the number of poor people.[2] As an anti-poverty device this strategy must be compared with others that might not involve a conflict between equity and efficiency. In a less egalitarian, well integrated society where political power is concentrated in the hands of the rich one might anticipate a tendency for educational policies to under-invest in primary education benefitting the masses and to over-invest in higher education benefitting the rich.[3] In diagram 1 marginal investments in the further education of a person belonging to the rich would yield a much lower rate of return than additional investment in the education of the poor. With these initial conditions there is no clash between equity and efficiency. It would be economically efficient to invest more in the education of the poor and raise their income prospects relative to those of the rest of the population.

One of the shortcomings of the human capital approach is that it focuses exclusively on the supply side of labor markets and neglects the demand side. It tells the direction future investments should take, but it fails to answer the question of how much investment optimally

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[1] Operation Headstart may be considered as an example of this type of educational investment.

[2] Interest in this issue is illustrated by the large number of contributors to "Investment in Education: The Equity-Efficiency Quandary," Journal of Political Economy, LXXX, 3, Part II (May/June, 1972).

[3] Perhaps it should be mentioned that even in the United States political disfranchisement of blacks went hand in hand with lower public expenditures per pupil in black schools than in white ones.

should be undertaken if rates of return are to be equalized at every level at a yield equal to the opportunity cost of capital. Increasing the relative supply of primary school graduates will have the initial effect of widening the wage differential between low and high educational levels and offsetting any improvement in income distribution attributable to a larger number of primary school graduates. To what extent this is an important offsetting factor depends on the ease of substitution among skill levels. If it is relatively easy to substitute one skill level for another then a widening wage differential will be counteracted on the side of labor demand as employers substitute lower for more highly skilled workers. Some studies have measured extremely high substitution rates so it may be possible to expand the supply of primary school graduates and encounter only slowly diminishing returns.[1] Increasing the relative supply of primary school graduates may also improve the overall distribution of income, not merely the distribution of labor incomes. This could occur if relatively unskilled labor were a substitute for capital and if more highly skilled labor, whose relative supply would decline, was complementary to capital since then the expansion of primary school graduates would be associated with a reduction in the marginal productivity of capital. That this may be a relevant case has been given some support by the work of Griliches.[2]

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[1] See, for example, S. Bowles, "Aggregation of Labor Inputs in the Economics of Growth and Planning: Experiments with a Two-Level CES Function," Journal of Political Economy, LXXVIII, 1 (January/February, 1970).

[2] Zvi Griliches, "Capital-Skill Complementarity," Review of Economics and Statistics (November, 1969). It is also possible that skilled labor may be complementary to unskilled labor in some instances. For the hypothesis that a high capital-labor ratio is a result of a low ratio of skilled to unskilled labor see W. Baer and M. Herve, "Employment and Industrialization in Developing Countries," Quarterly Journal of Economics (February, 1966).

3. Empirical Studies of Colombian Education

Where does Colombia fit into this picture shown in Diagram 1? Two studies of recent vintage suggest that Colombia fits the case of "discrimination against the poor" much more closely than the case of "discrimination in favor of the poor."[1] Schultz, with some sophistication, applied a rate of return framework to a cross-sectional 1965 sample of Bogotá wage data. For men he found that the private rate of return to primary schooling was 17 to 20 percent and for secondary and university schooling it was estimated in the ranges 29-38 percent and 4-5 percent respectively. Vocational training yielded the highest return of 50 percent. Among women it was discovered that earnings were unaffected by years of primary school completed. For completing secondary school women received a rate of return of between 14 and 21 percent while a university education was rewarded with a meager return of only 4 to 6 percent. As was true for men, vocational training also had the highest payoff of about 50 percent. Another interesting result was that migrants, for a given age-school class, did not appear to earn less than nonmigrants. Taking into consideration total costs (but not any social benefits), Schultz concluded that the social rate of return for men was 15.3 percent for primary schooling, 26.5 percent for secondary education and only 2.9 percent for university training. For women the same pattern of rates was zero, 13.5 and 3.6 percent.

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[1] These studies are by T.P. Schultz, "Returns to Education in Bogotá, Colombia," The Rand Corporation, Santa Monica, California, September, 1968; and M. Selowsky, "The Effect of Unemployment and Growth on the Rate of Return to Education: The Case of Colombia," Harvard University Development Advisory Service, Economic Development Report No. 116, November 1968.

In the case of vocational training the social rate of return was 35.4 percent for men and 30.8 percent for women. Selowsky also relied on a Bogotá wage sample, for a span of years 1963-66, but he adjusted this data for national unemployment and participation rates in urban centers. For men the highest social rates of return, around 29 to 35 percent, were calculated for primary education while the lowest rates, around 6 to 7 percent were found for university education. Rates of return in the middle range of 20 to 30 percent were estimated for secondary education. The highest rates of all were the marginal rates attached to completing any educational level. For men and women combined, Selowsky concluded that estimated social rates of return were very similar to those just presented. Using disaggregated production function analysis he tested to see how these rates of return responded to the expansion of skills at different levels and found that the rates were relatively insensitive to significant changes in the educational distribution of the labor force.

These results for Colombia seem to form part of an international pattern since they conform closely to what has been found in other countries. In Chile Harberger and Selowsky discovered that completion of primary, secondary and university education was rewarded with social rates of return of 24, 17 and 12 percent respectively.[1] In Malaysia Hoerr[2] confirmed that for all levels of education private rates of

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[1] Arnold C. Harberger and M. Selowsky, "Key Factors in the Economic Growth of Chile: An Analysis of the Sources of Past Growth and Prospects for 1965-1970." Mimeographed paper presented to a conference at Cornell University, April 20-22, 1966.

[2] O.D. Hoerr, "Education, Income and Equity in Malaysia," Economic Development and Cultural Change, XXI, 2 (January, 1973).

return exceeded social rates by substantial amounts indicating significant income redistribution toward the beneficiaries of education. The observed pattern was that the social rate of return to universally achieved primary education was less than the shadow price of capital, but not by much given the assumed externalities at this level, and that there was a relatively high social rate on secondary education but a relatively low one on university education. Krueger's judgment of the efficiency of Turkish education policy is similar.[1] Although university education is extremely profitable from a private point of view given the high degree of student subsidization, Krueger calculated that the social rate of return to higher education was not much above zero.

If the preceding rates of return for primary education in urban centers of Colombia were typical of those for rural primary schooling, policies to expand rural educational opportunity at the primary level would be highly desirable both socially and economically. Further investment in this direction would yield returns far in excess of what is considered to be the opportunity cost of capital, 11 to 14 percent, and would create higher incomes, both in absolute terms and relative to the rest of the population, for those at the bottom of the income distribution.[2] There are, however, theoretical and empirical grounds for believing that the returns to primary education may be lower in rural than in urban areas. It could be argued with some cogency that a faster rate of growth of rural primary educational

[1] A. Krueger, "Rates of Return to Turkish Higher Education," Journal of Human Resources (Fall, 1972).

[2] For an estimate of the shadow price of capital see A.C. Harberger, "La Tasa de Rendimiento de Capital en Colombia," Revista de Planeacion y Desarrollo, I, 3 (October, 1969), Bogotá, Colombia.

opportunities will contribute little to the growth of labor productivity because the demands of most agricultural jobs are so limited. One learns how to do these jobs by watching one's elders or parents perform them and by practicing the techniques one observes. Unless technical change is rapid and introduces better methods or better products which require basic literacy skills for successful adoption, the old ways may be the best ways independent of the amount of primary education one receives. In rural labor markets in Colombia there is some evidence of surplus labor in the sense that more workers want to work at the going real wage than are demanded by employers on large farms.[1] In this type of labor market situation it is conceivable that an increased supply of rural primary school graduates would displace older, illiterate workers who did not benefit from increased educational opportunities and reduce employment opportunities for them. In this case the wage rate received by both educated and uneducated workers would be the same but employers would naturally prefer to hire members of the former group over the latter.

On the empirical side Schultz has written in another study that "relative and absolute differences in income between rural and urban labor markets are greater for the educated than for the uneducated."[2] Thus the income gains to migration from rural to urban areas seem to increase with the level of education and schooling appears to

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[1] Some empirical evidence on this score can be found in W. Thirsk, "The Economics of Farm Mechanization in Colombia" (unpublished Ph.D. dissertation, Yale University, 1972) Chapter 4.

[2] T.P. Schultz, "Population Growth and Internal Migration in Colombia," The Rand Corporation, Santa Monica, California, March, 1969, p. 38.

be valued less highly in rural than in urban activities. Because educational costs are also lower in rural areas what this result implies for the rate of return on rural education is unknown. It could mean the rate of return is still attractive though not as high as in urban areas. This picture of relative returns is confirmed in a later study by DANE, the national statistics agency, which is summarized in Table 2. The data in this table indicate that where one receives his primary education as well as where one uses it affects his income level. These differences in earned income could reflect the fact that fewer years are spent in rural than in urban primary education, real differences in payoff, quality differentials in education received or, more likely, some mixture of all three phenomena.

A fresh perspective on the productivity of rural education has been provided by Tom Haller.[1] Haller's is the only available study which attempts to measure the social rate of return to rural education. Unlike the earlier urban studies Haller does not rely on wage

TABLE 2: Returns to Primary Education by Sector

Educational level	Average urban income (Pesos)	Average rural income (Pesos)
None	1,002	705
Urban Primary	1,628	961
Rural Primary	1,316	795
Total Primary[a/]	1,534	855

[a/] Total primary is the sum of urban and rural primary.

Source: Boletin Mensual de Estadistica, DANE, Bogota, No. 237, pp. 80-81.

data classified according to age and education but instead develops a production function framework to explain the productivity of education

[1] Tom Haller, "Education and Rural Development in Colombia" (unpublished Ph.D. dissertation, Purdue University, 1972.

for a sample of small farm owner-operators in different regions of the country. Following the analysis of Welch he hypothesizes that education may influence productivity in two quite different ways.[1] First, education may permit labor to produce more with the existing supply of on-farm resources. However, by holding the use of other inputs constant this worker effect understates the contribution of knowledge to output. Equipped with more or better education a worker may gain improved understanding of the cost and productivity characteristics of other inputs which enables him to allocate these resources more efficiently. This allocative effect may be an important part of the return to education which will be overlooked unless changes in education are permitted to vary the use of other inputs.

Haller's technique for handling this complication is an application of the use of slope dummy variables. Let the variable X_1 represent all productive inputs other than education and E be a dummy variable indicating the possession, or otherwise, of literacy skills. Ignoring education as a productive factor the production function is commonly expressed in logs as

$$Y = a_o + a_1 X_1 \ . \qquad (1)$$

If allocative ability is admitted as an effect of education the true specification of the production function becomes

$$Y = b_o + (b_1 + b_1^* E) X_1 . \qquad (2)$$

The expected value of the estimated coefficient for a_1 is then

[1] F. Welch, "Education in Production," Journal of Political Economy, LXXVIII, 1 (January, 1970).

$E(\hat{a}_1) = b_1 + \theta_{EX_1 \cdot X_1} b_1^*$ where $\theta_{EX_1 \cdot X_1}$ is the regression coefficient which results from the regression of the omitted variable EX_1 on the included variable X. The regression coefficients can be interpreted as $b = \partial Y / \partial X_1$, education constant

$$\theta_{EX_1 \cdot X_1} = E\left(1 + \frac{dE}{dX_1} \frac{X_1}{E}\right.$$

$$b_1^* = \partial(Y_1 X_1)/\partial E$$

Thus in this formulation of the problem education affects the level of input use $(\partial X_1 / \partial E)$ as well as technical productivity $(\partial(Y_1 X_1)/\partial E)$. The worker effect of education can be obtained by entering a separate(intercept) dummy variable for education so the final regression equation appears as

$$Y = b_o + (b_1 + b_1^* E)X_1 + b_2 E. \qquad (3)$$

The regression coefficient b_2 is the effect of education on output holding other inputs X_1 fixed.

Applying this approach to a cross-section sample of farms in four distinct agricultural regions Haller could find no significant worker effects in any region and significant allocative effects in only one region (the Espinal area of Tolima). Estimating benefits from the production function and combining this information with total cost data Haller computed a social rate of return of 54 to 68 percent for completing five years of primary school in this region. Although these are very respectable rates of return Haller's failure to detect significant returns to education in other regions leads him to question whether further investment in rural primary schooling will do much to foster rural economic development. Of course, the absence of a measurable worker effect may say more about the present type of rural education

than about the potential productivity of an educational program explicitly geared to the creation of agricultural skills.

The findings with respect to the allocative effect of education are strongly suggestive of a basic incompatibility between equity and efficiency in the provision of rural education. In Tolima where significant allocative effects were found a number of newer techniques and inputs were in use to a degree not found in any of the other regions. This implies that the payoff to rural education is greatest where the economic environment provides a large number of production alternatives from which to choose, i.e., the richer, already more developed regions, and is least in the poorest regions of the country where growth in output is severely constrained by adverse topography and poor soils which cannot be altered or improved by changes in farmers' production decisions. The luxury of making the best profit decision among several alternative possibilities is an option enjoyed primarily by farmers in the wealthier and better endowed regions. The root of the problem is that education appears to be complementary to inputs that are either missing or are hard, if not impossible, to substitute for, on farms in the poorest regions. As Haller notes, these findings are consistent with an earlier study in Brazil where it was found that the regions with the highest returns to education were the most advanced.[1] Despite the negative tones of these conclusions it should be mentioned that cross-section data may be inadequate in unveiling the productive impact of education in some regions. The

[1] G.F. Patrick, "Education and Agricultural Development in Eastern Brazil" (unpublished Ph.D. thesis, Purdue University, 1970).

presence of substantial spillover benefits, whereby uneducated neighbors learn from the experience of those who benefit from schooling, means that time-series data may be indispensable in testing for the productive effects of the diffusion of knowledge from education.

Another route by which education can affect productivity is through enhancing the skills rural migrants need to compete in an urban environment. Because of the skills provided rural primary school may stimulate outmigration to urban areas and permit members of a younger generation to escape the poverty of the countryside into which they would otherwise be enmeshed. It was shown earlier (in Table 2) that rural primary education reaps higher returns in an urban than in a rural setting. Only one study has sought to quantify the effect of education on rural outmigration.[1] Schultz's migration model revealed that schooling for the very young (ages 5 to 9) retarded outmigration while schooling for older, potential, migrants (ages 10 to 14) had the reverse effect. This was true for both sexes and all age groups. On balance it was calculated that if both age groups had their attendance increased by 22 percentage points the rate of outmigration would rise by half in 10 years. This schooling, while it is attractive to parents and discourages their migration, facilitates the outmigration of students in the future. In its role as a stimulant to migration rural education may have a payoff which approaches the high rate of return reported earlier for urban primary education.

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[1] T.P. Schultz, "Population Growth and Internal Migration in Colombia," Rand Corporation, Santa Monica, California, March 1969.

Up to now the discussion of rural education has focused exclusively on how its provision is related to efficiency and income distribution. It is time to recognize that the financing of education, quite independent of its provision, can also have a large bearing on income distribution. This is in fact implicit whenever a distinction is drawn between the private and social rates of return to education. If private and social rates of return are equal students, or their families, reap all the benefits and pay all of the costs of their education. In this case, if the rate of return were equal to the return that might be earned on an alternative investment, students, or their families, would pay for exactly what they receive and income distribution would be unchanged by the provision of educational opportunities. An implication of this analysis is that some public spending on education may have little allocative significance. If, in the absence of public supply or public spending on education the rich would furnish their own educational opportunities privately, the impact of public provision may be mainly distributional since the government through taxes and their expenditure on education merely substitutes for what the private sector would have done anyway. If the rich will provide for their schooling in any event it can be argued that the resources of the public sector, certainly on distributional grounds and perhaps on efficiency grounds as well, should be devoted exclusively to educating the poor. From a strictly allocative viewpoint educational subsidies should be inversely related to income level. This point has been elaborated upon indirectly in a recent study by Jallade.[1] He calculated that educational finance is

[1] Jean Pierre Jallade, "Public Expenditures on Education and

progressive in Colombia because the rich send their children to private schools and support public ones with their tax dollar. If the provision of education to the rich helps them to stay rich in the future at least the poor are not subsidizing them today to achieve that goal.

A comprehensive assessment of the supply of human capital to rural activities requires some consideration of the educational institutions outside the public school system, basically the training courses offered by the national apprenticeship program, SENA, and the farm extension services of the network of ICA experimental stations. ICA offers a package of rural extension services including farm demonstrations, field days, short courses, consultations, the distribution of farm literature and the sponsoring of radio programs. Not much is known about the effectiveness of these services. However, it is interesting that some 880 agronomos (extension workers) were licensed in 1969 to charge a fee for services rendered free of charge by ICA. In theory extension services can contribute to a reduction in income inequality by removing or attenuating the inverse correlation between risk aversion and farm size. If, in the absence of extension, new innovations tend to be adopted exclusively by large farmers who can afford to experiment and take risks, the introduction of extension may reduce the risks borne by smaller farmers and spread the income benefits from technological change more evenly than before. In other words, the rents accruing to larger farmers from early adoption of new techniques would be dissipated by an effective extension service and

Income Distribution in Colombia," World Bank Occasional Paper, No. 18, Johns Hopkins Press, 1974.

shared with smaller farmers. In practice, however, extension services in Colombia may be ineffective in reaching smaller farmers. As Berry has documented[1], extension personnel in Colombia are typically ill-prepared for their job, have an urban rather than a rural background, and tend to concentrate their visits to large farms in an area due to the ease of communicating with large farm owners and the social prestige attached to it. Assuming larger farmers would adopt new innovations without extension both efficiency and income distribution goals would be better served if extension workers were required to confine their visits to only small farms.

4. Some Tentative Conclusions for Economic Policy

To summarize an attempted synthesis is difficult and perhaps not worth the effort. Instead it may be more useful to emphasize the major policy implications to which the collection of cited material points. The most significant finding is that there is some justification for guarded optimism concerning the future development role of rural education, especially if the curriculum were revamped to give it a more applied and less classical character. To a degree that would vary by region and individual circumstances the extension of primary education to a greater number of rural inhabitants would appear to enhance the income prospects of those at the very bottom of the income distribution. In some high income rural areas, but perhaps only there, the social rate of return to rural primary schooling may be

[1] R. Albert Berry, The Development of Colombian Agriculture, Chapter 3 (forthcoming).

very high. In other areas rural primary education may improve welfare by stimulating migration to higher paying urban sectors, by reducing high rural birth rates and by raising the productivity with which credit resources are used. In addition the externalities of education, the ease of dealing with literate people, the avoidance of some costs of crime prevention, health care, etc., are probably greatest at this level of education and may justify the investment even where the private rate of return is low.

If the supply of rural primary education were increased the payoff to expansion would likely be higher if it were accompanied by policies to thwart the tendency to drop out of rural schools before completion. Free transport to and from school, free school lunches and a flexible school year tied to the rhythm of rural life and its seasonal demands are a few of the programs that might be worth introducing in an effort to raise retention rates.

PROGRAM OF DEVELOPMENT STUDIES

Discussion Papers

38. "On the General Equilibrium Analysis of Tax Incidence" (1973), 34 pp., J. Gregory Ballentine and Ibrahim Eris

39. "The Impact of Demand on Labor Absorption and the Distribution of Earnings: The Case of Brazil" (1973), 47 pp., Samuel A. Morley and Jeffrey G. Williamson

40. "A Note on Z Goods, Marketed Surplus and the Labor Intensity of Small Farm Agriculture" (1973), 22 pp., Wayne R. Thirsk

41. "The Incidence of Colombian Taxes, 1970" (1973), 66 pp., Charles E. McLure, Jr.

42. "What to Do about Foreign Direct Investment: A Host Country Perspective" (1973), 28 pp., Samuel A. Morley

43. "Income Distribution Consequences of Agricultural Price Supports in Colombia: (1973), 32 pp., Wayne R. Thirsk

44. "Factor Intensity of Consumption Patterns, Income Distribution and Employment Growth in Pakistan" (1973), 34 pp., Ronald Soligo

45. "Industrialization in Malaysia: A Penang Micro-Study" (1973), 42 pp., Fred R. von der Mehden

46. "Short-run Effects of Income Distribution on Some Macro-economic Variables: The Case of Turkey" (1973), 33 pp., Tuncay M. Sunman

47. "The Inequity of Taxing Iniquity: A Plea for Reduced Sumptuary Taxes in Developing Countries" (1973), 51 pp., C.E. McLure, Jr. and W.R. Thirsk

48. "A Numerical Exposition of the Harberger Model of Tax and Expenditure Incidence" (1973), 51 pp., C.E. McLure, Jr. and W.R. Thirsk

49. "Public Goods and Income Distribution: An Explanatory Comment" (1974), 17 pp., C.E. McLure, Jr.

50. "Education and Modernization in Zaire: A Case Study" (1974), 29 pp., Gaston V. Rimlinger

51. "Rural Credit and Income Distribution in Colombia" (1974), 26 pp., Wayne R. Thirsk

52. "The Short-run Burden of Taxes on the Turkish Agriculture in the Sixties" (1974), 41 pp., Marian Krzyzaniak and Suleyman Ozmucur

53. "Some Aspects of Efficiency and Income Distribution in Colombian Land Reform" (1974), 25 pp., Wayne R. Thirsk

54. "Income Distribution and Colombian Rural Education" (1974), 23 pp., Wayne R. Thirsk

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Note: Discussion Papers are available upon request to individual scholars and researchers and libraries of educational institutions.